Significance to the Horticulture Industry

Economic Contributions

Economic Contributions of the Green Industry in the United States in 2018. Charles R. Hall, Alan W. Hodges, Hayk Khachatryan, and Marco A. Palma. *Journal of Environmental Horticulture* 38(3): 73–79.

The green industry remains an important contributor to the U.S. economy and to individual states and regions. The green industry is extremely broad based, with the landscape services and wholesale-retail trade sectors existing in virtually all communities in the nation. In contrast, the production and manufacturing sectors are concentrated in some states and contribute disproportionately because of out-of-state shipments that bring new money into the local economies. The findings in this report are critical to our understanding of the structure-conduct-performance issues affecting the green industry, as well as the economy at large. Participants in the green industry now have access to data to assist them in making strategic decisions regarding future investments in their respective businesses. In addition, policy makers have better information to inform their decisions regarding efficient allocation of resources (e.g., water and labor) among competing industries and interests.

Ethylene and Cut Roses

Ethylene Exposure Exacerbates Botrytis Damage in Cut Roses. Ben A. Bergmann and John M. Dole. *Journal of Environmental Horticulture* 38(3): 80–90.

Botrytis damage to roses during storage and shipping continues to be a challenge for the cut flower industry, and decreased flower quality due to ethylene (ET) exposure can be a problem for some cut rose cultivars. This research confirmed that current cut rose cultivars vary considerably in Botrytis susceptibility and ET sensitivity. We found that Botrytis infection and development did not influence ET sensitivity, but exposure to ET increased Botrytis damage. This phenomenon occurred in both relatively Botrytis susceptible and non-susceptible rose cultivars and in both relatively ET sensitive and insensitive cultivars. The increased Botrytis damage was observed whether ET exposure was before or after *B. cinerea* infection. An anti-ET treatment may be warranted with cut roses to help prevent Botrytis damage during transport, even if the shipped cultivars are perceived to be Botrytis non-susceptible and/or ET insensitive.

Herbicide Tolerance in Groundcovers

Tolerance of Three Deep South Non-turf Ornamental Groundcovers to Applications of Postemergence Herbicides. S. Christopher Marble and Jeremy M. Pickens. *Journal of Environmental Horticulture* 38(3): 91–100.

Ornamental groundcovers have become a popular alternative to turfgrass due to reduced maintenance costs and low fertility and irrigation needs. While groundcovers are often resistant to pest infestations, weed control is a continual challenge for landscape maintenance professionals due to limited postemergence herbicide options. The objective of this research was to determine the tolerance of three commonly grown ornamental groundcover species [Asiatic jasmine (*Trachelospermum asiaticum* 'Minima')], dwarf mondo grass (*Ophiopogon japonicas* 'Nana'), and perennial peanut (*Arachis pintoi* 'Golden Glory') to ten different postemergence herbicides. Results showed that herbicides including sethoxydim, fluazifop-P-butyl, sulfentrazone, and halosulfuron were generally not injurious to any of the three species, with the exception that sulfentrazone caused significant injury to dwarf mondo grass and halosulfuron reduced shoot weight in mondo grass. Bentazon application did not result in injury to perennial peanut but caused injury to Asiatic jasmine and dwarf mondo grass. Glyphosate and glufosinate caused significant injury to all three species. This information provides landscape managers with herbicide options that could be used for postemergence weed control in these species and information on which herbicides were or were not injurious.

Humectant-amended Substrate

Post-transplant Water Utilization of Zinnia Seedlings Grown in Humectant-amended Substrate Maintained at Two Moisture Thresholds. Bruce R. Roberts and Chris Wolverton. *Journal of Environmental Horticulture* 38(3): 101–106.

The increasing scarcity, cost and regulation of groundwater sources for irrigation are issues that impact the long-term sustainability of horticultural crop production. To this end, providing water management strategies that improve substrate water retention and/or enhance water-use efficiency (WUE) is a topic of interest for greenhouse and nursery growers. In the current study, we examined changes in the water-holding capacity of a soilless substrate amended with humectant (1.6% Hydretain®) , and investigated the impact of humectant treatment on plant-water relations, WUE, growth, and flowering of container-grown zinnia 'Thumbelina' transplants maintained at two substrate moisture content (SMC) set points. For transplants grown in humectant-amended substrate at a low SMC threshold (0.25 $cm^3 \cdot cm^{-3}$), irrigation volume and frequency were reduced and WUE substantially increased. Height, stem diameter, and shoot dry weight were unaffected by humectant application, but the same growth parameters were significantly greater for transplants grown at the higher SMC threshold (0.45 $cm^3 \cdot cm^{-3}$). Data from this study demonstrate that water utilization can be substantially improved when zinnia transplants are grown in humectant-amended substrate maintained at a low SMC threshold (0.25 $cm^3 \cdot cm^{-3}$). This treatment regime resulted in a substantial reduction in the total volume of irrigation required for successful crop production without affecting post-transplant growth or flowering.

Phytophthora and Bedding Plants

Annuals and Herbaceous Perennials Tolerant or Resistant to Phytophthora species in the Landscape. M. Henson, S. Sharpe, and I. Meadows. *Journal of Environmental Horticulture* 38(3): 107–113.

This research provides knowledge of 22 plant cultivars within 13 herbaceous plant species that can be successfully cultivated in *Phytophthora*-infested soils for ornamental plant producers, landscapers, and the home gardener. This study also identified ornamental plants that are not ideal candidates for infested beds due to their susceptibility to other common diseases. Future investigations should re-evaluate plants that did not perform well due to abiotic issues. Additional plant cultivars exist that also need to be evaluated in order to provide stakeholders with as many options as possible for areas infested with *Phytophthora* species.